# TIG Benefit Estimate

*BPA Review and Response*
*10/4/05*

*Background:* Global Energy Decisions (a.k.a. Henwood Energy) was hired by the TIG steering committee to conduct an independent study estimating the regional benefits of implementing a RABA-enhanced TIG proposal, as currently envisioned by the TIG steering committee. The contractor worked independently, but his work was reviewed by a benefit assessment sub-committee.

Following is a review of the GED results and BPA's response to those results.

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| **Benefit:** | **Reliability** |
| **TIG Source:** | RABA, single AFC calculation |
| **Method of Analysis:** | Quantity – survey of hours of NW load lost over last 12 years<br>Value: displaced GDP used in GW work. |
| **GED Benefit Estimate:** | $6-$12 million/year |
| **Conclusion:** | |

"Because of these reliability organizations (PNSC) and the actions they have taken to improve reliability since 1996, Global Energy does not expect reliability in the next 20 years to deteriorate below levels from the last 20 years, even if TIG does not form."

"Under the Energy Policy Act of 2005, reliability focus will only increase, even without TIG".

"On the high side . . . the TIG proposals would eliminate an amount of cascading outage equal to all of the cascading outages that occurred over the last 20 years, equivalent to saving 5 hours of outage of the entire Northwest load over the next 20 years . . valued at $13 million/year".

**BPA Comment:**

- Global Energy Decisions (GED) used a different method for estimating avoided outages than did BPA in our GW work.
- The hours of outage listed are not comprehensive – not all cascading outages were counted.
- The hours of outage estimated is actually for a 12 year period ('88-2000). Using the same analysis as GED, adjusting for this fact, the high estimate would be $21 million.
- BPA *does not* believe that reliability will be the same in the absence of Grid West or TIG. While we recognize that there have been reliability improvements in the Northwest since 1996 (addition of the PNSC, among others). However, as time passes, the heightened awareness of reliability will decline. Transmission loading will increase, schedules will increase, inadvertent will increase – in all probability, without more sophisticated tools for understanding schedules and redispatching generation, these pressures are likely to lead to increases in system disturbances that lead to lost load. Indeed, we believe that reliability could be twice as bad as it has been historically. That would lead, using the GE analysis, to an annual cost of outages of $42 million/year.

- TIG benefits are less than Grid West because it does not combine as much transmission in RABA as does GW in the CCA (#s), nor does its operator have the same power to act as does the Grid West . GW consolidators are assumed to be PacifiCorp, BPA, and Idaho Power. RABA participants are assumed to be Puget, PGE, Seattle City Light and Bonneville. TIG does, however, deliver more of the I-5 corridor (under given assumptions) than does GW. This is estimated to make up for about 25% of the loss in benefits due to the loss of PacifiCorp and Idaho.

**BPA Estimate of TIG Reliability Benefits:**

BPA stands by its Grid West value of reliability estimate. We believe that TIG will reap roughly 47% of the reliability benefits of Grid West, based on the net transmission investment amongst the TIG participants compared with the net transmission investment amongst the Grid West participants. This yields an *estimate of $12.7 to $29.1 million/ year in benefits* that Bonneville would expect to see from TIG if there is full participation in RABA.

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**Benefit:** **Increased Transmission Capacity**
**TIG Source:** Common AFC calculations.
**Method of Analysis**: Hourly dispatch modeling on a 3% and a 5% increase in OTC
**$ Value**: $441,000 to $646,000 /year
**BPA Comment:**

- The Grid West analysis, conducted by Pacificorp using very similar methods on the Grid View model found these benefits to be in the $18-$30 million/year range. The large discrepancy between the two estimates calls for a closer look at the methods, assumptions, and databases used in both analyses.
- TIG is expected to have less of a transmission capacity benefit than Grid West. This is because it has a more restricted pool of participants, and because the method for submitting and pooling ATC information is more limited in TIG than in Grid West. Also, TIG will not have the reconfiguration auction as does Grid West. This reconfiguration auction is expected to help to free up transmission capacity.
- There are some questions as to GED assumptions about transmission conditions in the Northwest, hydro fuel costs, and whether they model the congestion typically seen in the Northwest. GED provides little to no explanation of these results.

**BPA Estimate:**

Lacking a clear explanation of the model used for the GED estimate, and lacking time to review it, BPA will stick with its original estimate of the value of increases in transmission capacity. We begin with our Grid West estimate of $9-$15 million and derrate those by 53% to reflect the difference in transmission capacity that will be combined in TIG vs. Grid West (as measured by net plant investment. *This yields an estimate of $4.2 to $7.1 million/year* in benefits that Bonneville would expect to see from TIG single AFC calculations.

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| **Benefit:** | **Reduction in Regulating Reserve Requirements.** |
| **TIG Source:** | **RABA consolidation** |
| **Method of Analysis:** | Assume (based on McManus study) 100 MW reduction in requirement. Used hourly dispatch modeling to assess production cost result. Also valued the 100 MWs as capacity that could be resold in the WECC at the opportunity cost of a CT. |
| **$ Value**: | $0 - $8.5 million/year |
| **BPA Comment:** | |

- The 100 MWs of reduced regulating capacity requirements measured by BPA's McManus is the result of combining the loads of BPA, PAC and Idaho. A similar exercise for RABA consolidators would yield a different benefit than the benefit estimated for Grid West ($5 to $8 million/year).

**BPA Estimate:**

Lacking the data needed to examine actual load variance in the RABA control area, we adopt a load-ratio share of the benefits anticipated for the GW CCA. Assuming that RABA includes Puget Sound Energy, Avista, Grant, and Bonneville (the TIG participants who have indicated a possible interest in RABA), RABA will have about 65% of the load of the Grid West CCA (based on NWPP load data). Accordingly, BPA expects TIG regulating reserve benefits of $3.3 to $5.3 million/year.

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| **Benefit:** | **Redispatch Efficiencies** |
| **TIG Source:** | Centralized redispatch bulletin board for congestion clearing |
| **Method of Analysis:** | Examined actual adjustments to generation in real time – came to 1%. Then assume $5/MWh savings/every MWh thermal rescheduled. Then assume 10% of that to be captured by TIG. |
| **$Value**: | $2.5 to $6.5 million/year |

**BPA Comment**:

- Assumes that the opportunity cost of hydro is close to zero – this is not true, even on a theoretical basis, when there are opportunities to sell surplus into California. In that case, the opportunity cost of hydro can be as high as the expected value of generation in California. This would lead to a higher savings figure for congestion-based redispatch.
- We disagree with GED's statement that there is a low level of congestion that occurs in the Northwest – especially if looking out into the future.

**BPA Estimate:**

We do believe that TIG will yield significantly less redispatch efficiencies than Grid West. This is because TIG's consolidators own less transmission and less generation than the GW consolidators, and because it will only redispatch to get around congestion. Lacking an alternative analysis, however, we will adopt the $2.5 to $6.5 million/year in redispatch benefits estimated by GED.

**Benefit:** **Contingency Reserve Efficiencies**
**TIG Source:** Contingency Reserve Bulletin Board
**Method:** Hourly dispatch modeling, using a base case wherein contingency reserves are met by individual control areas and a future case wherein contingency reserves are shared among RABA consolidators. RABA consolidators are assumed in one case to be BPA, PAC and Idaho, in another they are assumed to be BPA, Puget and PGE.

**$Value**: $40 - $80 million/year (BPA, Puget, PGE, Seattle)
**BPA Comment:**

- GED's results indicate that the consolidation of BPA, PACE, PACW and Idaho Power would yield $15-$30 million/year in benefits, whereas the consolidation of BPA, Puget and PGE would yield $40-$80 million per year. This is a curious result, given the difference in size of generator pool in the two redispatches. It also seems to indicate that, in the GED model, Puget and PGE are running thermal units for their reserves which do not reflect the normal practice of those companies.
- The base case includes the assumption of an existing consolidation of BPA, Seattle, Tacoma, and the Mid-C's. We question whether this base is a reasonable foundation for the estimate of consolidated contingency reserve benefits.

**BPA Estimate:**

Because of the counter-intuitive Operating Reserve result generated by GED's model, and because this counter-intuitive result is not explained in the report, Bonneville will adopt the lower benefit figure of $40 million/year.

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**Benefit:** **Depancaking**
**TIG Source:** **?**
**Method:** Hourly dispatch modeling
**$ Value:** $2,429,000/year
**BPA Comment:**

- Global Energy depicted all transmission sold by BPA as depancaked, then measured the benefit of depancaking all other transmission charges in the Northwest. We question the validity of this assumptions. BPA contracts commit the holder to a path through BPA and can prejudice users against alternative paths where pancakes must be paid, especially paths that don't cross over the BPA system. This can lead to inefficient dispatch. Furthermore, the opportunity cost of selling a point-to-point right and purchasing an alternate service is influenced by the existence of pancakes and can prejudice dispatch against least cost solutions. Finally, unused but previously sold transmission capacity is re-sold by TBL on a pancaked basis in close to real time. Thus we believe that this value is a bare-minimum value for pancaking.
- BPA does not believe that the TIG proposal allows for significant depancaking of transmission rates.

**BPA Estimate**: $0/year